

## Sequential integrations of badnaviruses into the *M. acuminata* and *M. balbisiana* genomes

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*Banana streak virus* (BSV) is a double stranded DNA pararetrovirus belonging to the genus *Badnavirus* and triggering necrotic mosaic lesions on banana plants. BSV exhibits a higher biodiversity than other badnaviruses as a consequence of two phenomena: the epidemic process of the disease through contamination of plant to plant by vector and the release of infectious viral genomes by the banana genome harboring endogenous sequences. BSV sequences described so far are spread among the three groups of the badnavirus diversity. BSV-like sequences belonging to group 2 seem to be all integrated into the banana genome since no infectious episomal particles have been identified so far. We describe here the characterization of such integrations in thirty-four plant samples belonging to different families of the Zingiberale order with a banana sampling representative of the *Musa* diversity. We have firstly looked for group 2 sequences using PCR with 7 sets of primers which are specific of the 7 BSV-like species identified so far in this group. We then used Southern blot approach with viral probes corresponding to each BSV-like species. Sequenced PCR products of the RT-RNase H region of the viral genome have been used for the construction of a phylogenetic tree. We found all the 7 BSV-like species within the A genomes whereas only 4 species were within B genomes. Interestingly, two new species have been discovered in *M. balbisiana* genomes only. Additionally, four BSV-like species seem to be integrated in *M. schizocarpa*, *M. basjoo*, *M. ornata* and *M. itinerans* but these results have to be confirmed. The integration patterns observed by Southern blot analysis show multiple and different integrations of BSV-like species into *M. acuminata* plants conversely to *M. balbisiana* plants where patterns are highly conserved. The data suggest that BSV-like integrations likely occurred for some of them before the speciation *M. acuminata*/*M. balbisiana* whereas others occurred afterwards.